Author's response to reviews

Title: Environmental mobility barriers and walking for errands among older people who live alone vs. with others

Authors:

Li-Tang Tsai (li-tang.tsai@jyu.fi)
Merja Rantakokko (merja.rantakokko@jyu.fi)
Erja Portegijs (erja.portegijs@jyu.fi)
Anne Viljanen (anne.viljanen@jyu.fi)
Milla Saajanaho (milla.saajanaho@jyu.fi)
Johanna Eronen (johanna.eronen@jyu.fi)
Taina Rantanen (taina.rantanen@jyu.fi)

Version: 2 Date: 29 October 2013

Author's response to reviews: see over
Dear Editor,

We are grateful for the opportunity to resubmit our manuscript to BMC Public Health and we want to thank the reviewers for their constructive criticism. We believe that their suggestions and comments have helped us to improve the quality of our manuscript.

We have responded to each comment in detail and have revised the manuscript according to them. We have copy-pasted the original questions/comments, numbered them consecutively and give responses [R] to them below. In addition to the changes made according to reviewers’ comments, we have started to use abbreviations for different walking for errands categories. All revisions made in the manuscript are highlighted using red font color.

We look forward to your decision on our paper.
Additional changes

Use of abbreviations

We have started to use abbreviations for different walking for errands categories as follows: ‘low amount of walking for errands’ (LOWER), ‘moderate amount of walking for errands’ (MODWER), and ‘high amount of walking for errands’ (HIGWER). We have now added this information to the manuscript (Abstract: page 1, lines 37-41; Methods: page 5, lines 139-145).

Responses to the questions of Thorlene Egerton:

Major Compulsory Revisions

1. Please comment on what is known about validity and reliability of your measures of ‘walking for errands’ and ‘environmental barriers’. If there have been no studies evaluating the validity or reliability of the measurement tools, please state this in the methods and refer to this as a limitation in the discussion and comment on how the results may be affected.

[R] Walking for errands was elicited with the question “How much do you walk outdoors in the course of your daily activities, such as shopping, walking to the bus stop, etc.?” The reliability for self-reported kilometers walked in a week was found to be good and is reported earlier (reliability study described Leinonen R, et al., 2007. Scand J Med Sci Sports, 17(2):156-164). For the purpose of the current study we calculated the reliability of the current categorization used for walking for errands among 29 older people interviewed twice two weeks apart. The reliability for the categorization as assessed with Kendall’s tau-b was 0.93. We have now added this information to the manuscript (page 5, lines 145-147).

Also previous studies have used self-report method to assess walking for errands (King D, 2008. J Aging Phys Activ, 16:144-170; Oliver L & Hall A, 2007. International Journal of Health Geographics, 6:41. doi: 10.1186/1476-072X-6-41). Our method was almost identical with the CHAMPS (Community Healthy Activities Model Program for Seniors) activity questionnaire for older adults, an assessment tool validated by comparing interview data and

The environmental factors studied here were considered to be relevant for the mobility in this age group by an expert group who produced the list based on their experience and earlier research experience in a Finnish context (Heikkinen E, 1998. *J Aging Phys Activ*, 6:106-120; Rantakokko M, et al., 2009. *J Am Geriatr Soc*, 57(4):634-640; Rantakokko M, et al., 2012. *Age Ageing*, 41(1):118-121). Similar barriers were identified in a study on older people’s views on pedestrian security (Ståhl A, et al., 2008. *European Journal of Ageing*, 5:265-273). Self-reports of environmental barriers resemble those made by professionals when respondents have had recent experiences of moving within the environment evaluated (Fänge A & Iw arsson S, 2003. *Disab Rehab*, 25:1316-1325). In our study, all participants were able to move outdoors, and thus we think that self-reports of environmental mobility barriers are valid.

2. For example are there big differences in ‘walking for errands’ and overall activity levels or exercise participation levels?

[R] ‘Walking for fitness’ was also assessed in this project and concerns a different concept. While those with higher level of walking for errands mainly had also high levels of walking for fitness (86%), we found that approximately 75 % of those having low level of walking for fitness had moderate or high level of walking for errands. This confirms our suggestion in the discussion that it is also possible that older people do not give up walking for errands, even though they give up walking for fitness (page 12, lines 291-292). Consequently, it appears that there is less of a ‘floor effect’ in the distribution of walking for errands than walking for fitness.

There were two main reasons for choosing to study the association between walking for errands and environmental factors among older people. Firstly, walking for errands is a meaningful form of walking, which can be easily integrated into daily routine of community-dwelling older people. We have discussed this in the introduction section (page 3, lines 89-91). Secondly, environmental features may be more strongly associated with walking for errands than with walking for fitness among older people (Shimura H, et al., 2012. *J Phys Act Health*, 9(7):1004-1008; Shigematsu R, et al., 2009. *Med Sci Sports Exerc*, 41:314-321).
3. The authors state in methods (lines 148-150) “We observed a significant interaction between living arrangements and environmental mobility barriers for the odds of low walking activity (p<0.001). Therefore, we stratified the participants according to living arrangements.” Given the title of the paper and the stated aim of the study I think separating the participants by living arrangement is essential to answer the research question. These findings can be reported in the results section.

[R] Testing the interaction term is an important part of the study and it justifies the research question and the analyses that are conducted. The presence of the interaction, justifies the separate analyses for those living alone and living with others. Thus we would like to keep our analyses as they are and explain the interaction analyses in the methods and in the results, as suggested in the STROBE criteria (von Elm E, et al., 2007. Lancet, 370:1453–1457).

Please see also our response to your comment 7 for explanation of “interaction” in this context.

4. Can you please re-word your description of the data analysis you carried out, so that it more clearly describes how it will answer your research question?

[R] We have re-written the statistical analysis part in the method section as follows (pages 6-8, lines 170-198): ‘Participants’ characteristics were described using means and standard deviations (SD) or percentages according to amount of walking for errands and living arrangements, and differences were tested with chi-square tests for categorical variables and ANOVA or t-test for continuous variables. T-test was also used for analyzing differences in distance and frequency in walking for errands according to environmental mobility barriers.

We observed a significant interaction between living arrangements and environmental mobility barriers for the odds of low walking activity (p<0.001). Two sets of multinominal regression analyses were performed to identify the associations between environmental mobility barriers and walking for errands. In the first set of analysis, participants were stratified according to their living arrangements (living alone or living with others). For each environmental mobility
barrier the odds for LOWER and MODWER were computed separately with HIGWER used as the reference value.

In the second set of multinominal regression analysis, we included all the participants in the same analysis by creating a combined distribution for the independent variables. For the living arrangements, and for each environmental mobility barrier, the following categorization was computed: lives alone and reports a barrier, lives with others and reports a barrier, lives alone and does not report a barrier, and lives with others and does not report a barrier. As the reference group, we used those who lived alone and did not report a barrier, as they had the lowest prevalence of LOWER. The odds for LOWER and MODWER vs. HIGWER were calculated separately for each environmental mobility barrier by living status categorization.

All multinominal regression analyses were adjusted for age and gender. Owing to the low number of people in some categories of the independent variables, we added walking speed, number of chronic conditions, and CES-D score into the models one at a time to control for health differences (models not shown but data available from the authors upon request). Men and women were included in the same models, as gender-stratified analyses produced practically identical results. Results are reported as odds ratios (OR) and 95% confidence intervals (CI). Differences were considered to be statistically significant when p ≤ 0.05.

Statistical analyses were performed using the SPSS program (SPSS 19.0 for Windows/Mac, IBM).”

5. It is quite confusing to read. There seems to be one research question but multiple statistical analyses.

[R] The aim of the present study was to examine the association between self-reported environmental mobility barriers and walking for errands among older people with different living arrangements. We answered our research question using multiple steps leading towards the final answer. We first presented basic characteristics of the participants, grouped both according to amount of walking for errands and living arrangements in Table 1. Then, we presented mean
distances and frequencies of walking for errands according to whether or not reporting a certain environmental mobility barrier in Table 2. Afterwards, we presented two sets of multinominal regression analysis. The first set of analysis was stratified by living arrangement. This modeling gives us an idea about whether an environmental mobility barrier increases the odds for low walking for errands activity within the living arrangement categories. However, the odds among those living alone and for those living with others were not comparable, because both series of models had their own reference categories. For the second set of multinominal regression analyses all people were included in the same models with only one reference category for each barrier. This makes it possible to compare the odds for low walking for errands between all the categorizations of the independent variables. This set of models demonstrates the effect of the environmental barrier by living arrangements interactions on the odds for walking for errands categories.

Consequently, all analyses presented in the tables are essential to answer the research question completely, and the tables work as different steps toward the final answer, where each step needs to be made to justify the next step.

6. Line 173 “Distances as an environmental mobility barrier correlated with low walking activity...” I think this statement was based on the findings of the Chi square test (Table 1 data) so I found it confusing that you used the word ‘correlated’.

[R] We have replaced the word ‘correlated’ with ‘was associated’ (page 8, line 205).

7. Line 181-184. It is not clear what you mean by ‘interaction’ or which of your analyses this statement resulted from.

[R] In epidemiology an interaction refers to a situation where the direction or magnitude of an association between two variables differs due to the effect of a third variable. In the current study, we observed that the associations between environmental mobility barriers and walking for errands differed according to living arrangement.
8. Again, the analysis section needs to more clearly relate to your research question(s) and your results should be organized in the same way as your proposed analysis to make it easier for readers to follow.

[R] We have re-written the statistical analysis section as cites above as a response to the comment 4 (pages 6-8, lines 170-198).

9. Perhaps you can consider including only those analyses that answer your research question as there is currently a lot of data presented in tables.

[R] We explained our logic in arranging and presenting the four tables in the answer to Comment 5. We consider the analyses included in Tables 1-4 all important and crucial for answering our research question. Even though we have carried out several analyses before the two final regression models and can answer some intermediate research questions (e.g. differences in characteristics between participants with different amount of walking for errands and living arrangements), we decided to not include all the intermediate research questions under the aim of our research to focus on just one main research question.

10. Lines 188-189 “...some environmental mobility barriers seemed to lower the odds for low walking activity. However, the associations were not statistically significant”. If the associations weren’t statistically significantly different that means they probably weren’t different. Please consider altering the sentence so it does not suggest that the odds were lower for some barriers?

[R] We have omitted this sentence from our text.

11. Lines 238-240 “Consequently, older people living alone may be at a lower risk for functional decline in the future compared to those living with others. However, this needs to be confirmed in future studies.” I consider it not reasonable to suggest that living alone reduces risk of functional decline based on your study data. You did not measure functional decline and the relationship between walking for errands and functional decline is likely to be extremely
complex and has not been specifically established. I suggest this section is reworded to better reflect what can be reasonably deduced from your findings.

[R] In the previous sentence, we mentioned “Very low walking activity is a risk factor for further functional decline” with reference. We have revised the sentence as follows to label it clearly as speculation with stronger link to the previous sentence as our support: “As people living alone have lower prevalence of LOWER in our study, we suspect that older people living alone may be at a lower risk for functional decline in the future compared to those living with others” (page 11, lines 271-274).

12. Lines 248-248 “In addition, we were able to adjust our models for walking speed, a valid and objective indicator of the functional status of older people [27, 28].” In the methods section there is no mention of adjustment for walking speed in any of the analyses.

[R] Your comment made us realize that we had not included an explanation of the adjustments into the manuscript. We have now added them into the relevant sections as follows:

Methods (page 7, lines 190-193): "Owing to the low number of people in some categories of the independent variables, we added walking speed, number of chronic conditions, and CES-D score into the models one at a time to control for health differences (models not shown but data available from the authors upon request).”

Results (page 9, lines 231-234): “Adding the number of chronic conditions and CES-D score into the models one at a time had no material influence on the odds ratios. Adding walking speed into the models attenuated the odds to some extent, but the pattern of associations remained similar to those in the models adjusted for age and gender (data not shown).”

Discussion (pages 10-11, lines 260-264): “This is supported by the fact that walking speed – an objective measure of physical functioning – attenuated the odds ratios to some extent. However, the odds ratios remained significant and consequently we concluded that the association was not completely explained by poorer physical functioning among those reporting Distances as a mobility barrier.”
Conclusions (page 13, line 315-316): “It is possible that some of the associations reported here may be due to poorer health among those who report environmental barriers and low amount of walking for errands.”

13. Again, I suggest the analysis section be re-written to be clearer, more complete, and to better reflect the research question(s).

[R] We have re-written the analysis section to make it more clear and focused (pages 6-8, lines 170-198) for further detail we refer to comment 4.

14. Lines 252-254 “Most of the participants were living in condominiums and some in detached houses within a radius of approximately 5 km in the same urban area.” I think this is important information for interpreting the generalizability of your results and also for understanding the findings and could be made clearer earlier in the paper. Given all the participants lived in a relatively small area, more information about the actual traffic and terrain aspects of the area would be helpful.

[R] We have added a description in the methods section to give more information about the geographic characters of our study area as follows (page 4, lines 123-127): ”The urban area where the study was conducted is characterized by small hills. Many streets are rather quiet with predominantly only residential traffic with some streets with more traffic intersecting. There are several small parks with seating areas. Most of the shops and other services are concentrated in the city center, which is located also in the center of the current study perimeter.”

15. Lines 273-275. Further to previous suggestion, you correctly report the association as those living alone had increased likelihood of reporting barriers rather than reporting that those living alone tended to encounter more barriers. And given that the participants all lived in the same area and therefore may have had relatively similar exposure to certain features of ‘environmental barriers’, I’m not sure that you should conclude that the environment needs to be changed. I wonder if perhaps you should consider the perception of barriers as the problem, rather than the barriers themselves.
[R] We discussed this topic in the discussion section (page 10, lines 248-250): "We speculate that, owing to their greater walking activity, those who live alone are more exposed to and hence better aware of the existing environmental mobility barriers, and consequently also more likely to report them."

We do not believe that the problem is perception of barriers, but rather think that poorer health and functioning may make people more prone to perceiving mobility barriers. We discussed this on page 10, lines 259-260: “It is also possible that perceiving Distances as a mobility barrier reflects poorer health and physical functioning.”

We have revised the conclusion section to suggest possible environmental features which can promote physical activity among those living with others and warrants further study to better understand, what behavioral patterns underlie their lower activity, and how they could be encouraged to be more physically active (pages 12-13, lines 305-320). The full version of revised conclusion section is attached an answer for the following Comment 16.

16. I think your data nicely highlights the complexity of these relationships and I was disappointed to read your simplified conclusions which focused on changing the environment. I don’t feel your conclusions adequately reflect the aim of the study which was much more complex.

[R] We have revised the conclusions as follows (pages 12-13, lines 305-320): “Among older people, the associations of environmental mobility barriers with walking for errands differ for those living alone vs. living with another person. Older people living with others had higher odds for low amount of walking for errands. This topic warrants further study to better understand the behavioral patterns that underlie the lower walking activity of these individuals and how they could be encouraged to be more physically active. Perceiving long distances to services as a mobility barrier was consistently associated with increased odds for low amount of walking for errands regardless of whether people lived alone or with others. Consequently, living in areas where there are local services and attractive walking destinations in the near vicinity of home may promote physical activity. The present results may be generalized to older people who are able to walk independently outdoors and who live in regular housing in urban areas. It is possible
that some of the associations reported here may be due to poorer health among those who report environmental barriers and low amount of walking for errands. The present results may serve as a justification for future studies. Prospective studies would help to gain an idea of future trajectories of walking for errands, thereby clarifying the temporal order of the variables studied here, while qualitative studies would help us better understand the relevance of the studied associations in older people’s lives.”

17. (Reviewers question: Do the authors clearly acknowledge any work upon which they are building, both published and unpublished? Reviewer’s opinion: No) Overall I think the paper would benefit from stronger links to the existing knowledge on the topic. It is a complex problem and there has been a substantial body of literature looking at the associations between environment and physical activity.

[R] We have edited the introduction section by expanding the section discussing the associations between environment and physical activity among older population as follows (pages 3-4, lines 98-107): “Environmental facilitators for mobility such as having a park nearby decrease the risk for developing walking difficulty among older people [11]. Environmental features may be more closely associated with walking for errands than with walking for leisure among older people [12, 13]. Walking for errands among older people is positively related to access to services and mixed land use [12, 14]. Presence of multiple environmental mobility facilitators can motivate older people to walk for errands [15]. So far, there is limited information about the association between environmental mobility barriers and walking for errands. Further understanding of this topic is a crucial step towards promoting optimal mobility among older people, defined as being able to choose when, where, and how one wishes to go, safely and reliably [16].”
Discretionary Revisions

1. Line 66-67. “..engaging in community walking is an important prerequisite for social participation [4]” Can this be reworded? It implies that social participation can only occur if one walks in the community. There are many ways to be social.

[R] We have revised the sentence into “engaging in community walking is an important contributory factor for social participation” (page 3, line 88-89).

2. The proposed results of the study (Lines 85-87) seem a little overstated. Can this study really achieve these things?

[R] We have omitted this sentence from our text.

3. Line 109. Suggest changing sentence to: “Participants were informed about the research before signing a consent form.” Or something similar.

[R] We have revised the sentence according to your suggestion (page 5, line 134).

4. The paragraph (lines 142-147) is difficult to follow. Can you try and re-word it for better clarity for readers.

[R] We have revised the paragraph (page 6-7, lines 170-174) as follows: “Participants’ characteristics were described using means and standard deviations (SD) or percentages according to amount of walking for errands and living arrangements, and differences were tested with chi-square tests for categorical variables and ANOVA or t-test for continuous variables. T-test was also used for analyzing differences in distance and frequency in walking for errands according to environmental mobility barriers.”
5. It would help if you use exactly the same terms for your outcome measures every time you mention them (e.g. Walking for errands vs walking activity) throughout the paper.

[R] We have started to use abbreviations for different walking for errands categories as follows: ‘low amount of walking for errands’ (LOWER), ‘moderate amount of walking for errands’ (MODWER), and ‘high amount of walking for errands’ (HIGWER). We have now added this information to the manuscript (Abstract: page 1, lines 37-41; Methods: page 5, lines 139-145) and have checked throughout the manuscript and changed the term for outcome measures accordingly.

6. Lines 232-237 “It is a reasonable assumption that people living alone more often need to negotiate the Entrance barriers by themselves.” While this may be true, it may also be worth commenting on the slower walking speed (walking speed is related to health status and functional ability) and the nearly significantly larger number of people reporting health problems in the living alone group. These factors may also explain the reason for entrances being a problem.

[R] We have added in the statistical analysis section how we adjusted for confounding factors, including walking speed (page 7, lines 190-193) and how it did not affect the pattern of associations observed in the results section (page 9, lines 232-234) as follows: “All multinominal regression analyses were adjusted for age and gender. Due to low number of people in some categories of the independent variables we added walking speed, number of chronic conditions, and CES-D score into the models one at a time to control for health differences (models not shown but data available from the authors upon request).”

“Adding walking speed into the models attenuated the odds to some extent, but the pattern of associations remained similar as in the models adjusted for age and gender (data not shown).”
Responses to the questions of Peter Croft

1. A major issue is the extent to which people who live alone are selectively different in ways that will affect walking - e.g. healthier - than those who live with someone. The authors consider this in the discussion, but have collected data on possible confounding factors that might allow at least partial analysis of this. Although the measures are listed in the methods, and the adjustment referred to in the discussion, there is no reference to these in the analysis section of the methods or the results section Better specification of the possible role of the confounders, the way in which they were analyzed and the extent to which the results allow the authors to conclude that confounding is unlikely to explain the results would greatly strengthen the scientific account of the research.

[R] Yours and other reviewer’s comments made us realize that we had not included this explanation in the manuscript. We have adjusted the models for walking speed, number of chronic conditions, and CES-D depression score. The adjustments were made by adding one confounder to the model at a time in addition to age and gender, and then replacing it with the next confounder. Adding the number of chronic conditions and CES-D score into the models one at a time had no material influence on the odds ratios. Adding walking speed into the models attenuated the odds some, but the pattern of associations remained similar as in the models adjusted for age and gender. The following sections in the manuscript have been revised accordingly:

Methods (page 7, lines 190-193): “Owing to the low number of people in some categories of the independent variables, we added walking speed, number of chronic conditions, and CES-D score into the models one at a time to control for health differences (models not shown but data available from the authors upon request).”

Results (page 9, lines 231-234): “Adding the number of chronic conditions and CES-D score into the models one at a time had no material influence on the odds ratios. Adding walking speed into the models attenuated the odds to some extent, but the pattern of associations remained similar to those in the models adjusted for age and gender (data not shown).”

Discussion (pages 10-11, lines 260-264): “This is supported by the fact that walking speed – an objective measure of physical functioning – attenuated the odds ratios to some extent. However,
the odds ratios remained significant and consequently we concluded that the association was not completely explained by poorer physical functioning among those reporting Distances as a mobility barrier.”

Conclusions (page 13, line 315-316): “It is possible that some of the associations reported here may be due to poorer health among those who report environmental barriers and low amount of walking for errands.”

2. The other issue of selectivity is the extent to which all persons in this study were a highly selective group of the population of this age. Although this will not necessarily affect the internal associations the authors describe, it may have a major effect on the conclusions being drawn - especially those with public health policy significance. I really want to know if we are seeing results about a healthy small minority of the population or not since this will really influence my interpretation of what to do as public health policy. The authors hint that they are selective - they are all from an RCT, they all had to have a minimum mobility, and in the discussion it is revealed that people of low or high activity were excluded.

[R] We appreciate your concern and have tried to clarify this point. The fact that walking speed is available in many large studies may help to clarify the comparability of our sample with other representative studies. We compared walking speed of the current study population with those from Evergreen project (an earlier study with local representative samples), Health 2011 survey of Finland and Health survey for England 2005 (Laukkanen P, et al., 1995. Age Ageing, 24(6):468-473; Seppo K, et al., 2012. Health, functional capacity and welfare in Finland in 2011. National Institute for Health and Welfare (THL), Helsinki 2012; Asher L, et al., 2012. Age Ageing, 41(5):690-694). Compared to the Evergreen study, which included 75- and 80-year-old people, the participants of the present study had slightly slower walking speed. Compared to a representative Finnish national sample which included also people older than those in the present study, the participants of the present study had a slightly faster walking speed. Finally, when comparing our results with the UK national representative sample of similar age range, we concluded that the results were rather comparable considering that we measured maximal walking speed and the UK study measured usual walking speed, which is typically about 30% slower than maximal walking speed.
Our data are from the baseline of a randomized controlled trial investigating the effects of physical activity counseling on mobility of older sedentary people. For the purposes of the original trial, participants needed to be able to walk 500 meters, have no apparent memory impairment and be at most moderately physically active. Stemming from the design of the original study, both the most active and the most disabled individuals were excluded. Therefore, the distribution of functioning and walking in the current study is located around the population average, but is likely to be somewhat truncated. Consequently, the present results are likely to underestimate the actual strength of the associations (page 12, lines 297-301).

3. There should be a clear section describing the extent of these limitations and an estimate of the selectivity of the population.

[R] We have edited the discussion section to better clarify this issue as follows (page 12, lines 297-301):” It should also be noted that, stemming from the design of the original study both the most active and the most disabled individuals were excluded. Therefore, the distribution of functioning and walking in the current study is located around the population average but is likely somewhat truncated. Consequently, the present results are likely to underestimate the actual strength of the associations.”

4. The major concern in this paper is how the results are discussed and the conclusions drawn. Much of the explanation of the results appears speculative and this should be clearly labeled as speculation.

[R] We have added references to support our views in the discussion section wherever possible (attached in answer to Comment 5 below), and also edited the text throughout the manuscript to make speculative explanations more clearly distinguished:

“We speculate that, owing to their greater walking activity, those who live alone are more exposed to and hence better aware of the existing environmental mobility barriers, and consequently also more likely to report them.” (Page 10, lines 248-250)
“As people living alone had a lower prevalence of LOWER in our study, we suspect that older people living alone may be at a lower risk for functional decline in the future compared to those living with others.” (Page 11, lines 271-274)

5. However there are also places where the authors could be more diligent in their search for supporting evidence for their speculation, For example, have there not been sociological studies of older people which would shed light on how they behave if alone or with a partner with respect to likelihood of walking errands or using transport?

[R] Thank you for your suggestion to look for sociological studies concerning this topic. We have added a few more references to support our views in the discussion section (references numbers 17, 25, 26): “Our findings are in line with two earlier observations, i.e. older people most often receive help from their spouse when their functional capacity declines [25] and that walking outside the home was more common for older women who live alone than those living with another person [17].” (Page 10, lines 245-247)

“As those living with others have less experience of negotiating their nearby environment, they are probably also less aware of the environmental mobility barriers, which results in less reporting of them [26].” (Page 10, lines 250-252)

6. If there have been no such empirical studies, then some speculation is reasonable but it should be clearly labeled as such and some indication of the type of research needed to establish the truth of any particular explanation being given. The importance of this becomes clear in the final conclusions which I would regard as completely unjustified - the results are interesting but could equally well be concluded as saying it is healthier to live alone and closer to a city. My feeling is that it would be better to summarize the population to which these results might apply (how selective?), the likelihood that there may still be health state as an explanation (how much confounding?), and the possibility that it may be more important to target people who live with others for physical activity promotion than to target environmental barriers. Then discuss the research that would unravel this and why it is important to get at the truth.
We have revised the conclusion as follows (pages 12-13, lines 305-320): “Among older people, the associations of environmental mobility barriers with walking for errands differ for those living alone vs. living with another person. Older people living with others had higher odds for low amount of walking for errands. This topic warrants further study to better understand the behavioral patterns that underlie the lower walking activity of these individuals and how they could be encouraged to be more physically active. Perceiving long distances to services as a mobility barrier was consistently associated with increased odds for low amount of walking for errands regardless of whether people lived alone or with others. Consequently, living in areas where there are local services and attractive walking destinations in the near vicinity of home may promote physical activity. The present results may be generalized to older people who are able to walk independently outdoors and who live in regular housing in urban areas. It is possible that some of the associations reported here may be due to poorer health among those who report environmental barriers and low amount of walking for errands. The present results may serve as a justification for future studies. Prospective studies would help to gain an idea of future trajectories of walking for errands, thereby clarifying the temporal order of the variables studied here, while qualitative studies would help us better understand the relevance of the studied associations in older people’s lives.”
Responses to the questions of Eleanor Simonsick

1. In the background section, you review some of the published findings on living arrangement and walking activity. It may be useful to add (in support of your argument) findings from Simonsick et al JAGS 47:672-680, 1999 that found living alone associated with a higher likelihood of walking outside the home which was even more pronounced in older women reporting no walking difficulty.

[R] Thank you for providing this useful reference, we have added it into the background as well as the discussion section.

Background (page 4, line 108-110)
Discussion (page 10, line 246-247)

2. Although you comment on the exclusive focus on errand related walking in the discussion, it is not clear if engagement in other types of walking was assessed or not. Whether “pure” exercise-related walking serves to enhance or facilitate errand-related walking or replaces it remains to be determined and likely varies across individuals.

[R] ‘Walking for fitness’ was also assessed in this project and concerns a different concept. While those with higher level of walking for errands mainly had also high levels of walking for fitness (86%), we found that approximately 75 % of those having low level of walking for fitness had moderate or high level of walking for errands. This confirms our suggestion in the discussion that it is also possible that older people do not give up walking for errands, even though they give up walking for fitness (page 12, lines 291-292). Consequently, it appears that there is less of a ‘floor effect’ in the distribution of walking for errands than walking for fitness.

There were two main reasons for choosing to study the association between walking for errands and environmental factors among older people. Firstly, walking for errands is a meaningful form of walking, which can be easily integrated into daily routine of community-

3. Since this is a cross-sectional observational study, you need to take care to avoid terms that imply causality. For instance, the first sentence of the last paragraph of results uses the word “influence” as does the title of Table 4. Similarly, the first paragraph of the discussion should be revised to read something like: We observed that the association between self-reported environmental barriers and walking for errands differed by living arrangement such that living alone in old age was associated with a lower probability of low walking activity but higher reporting of environmental barriers; whereas living with others was associated with a lower probability of reporting environmental barriers, but a higher likelihood of low walking activity.

[R] We have taken away uses of the word “influence” throughout the manuscript to avoid implication of causality and edited the first paragraph of the discussion (page 9, lines 237-240). The title of Table 4 has now been changed to “Odds rations for low and moderate amount of walking for errands among older people with different living arrangements and perceived environmental mobility barriers”

4. Although most of your speculative explanations for the findings in the discussion seem reasonable, the discussion would benefit from the addition of a few more references to support some of your non-referenced statements. I recognize that the literature in this field is somewhat sparse; nevertheless, all strong statements should be referenced to the extent possible.

[R] We have added a few more references to support our views in the discussion section (references numbers 17, 25, 26): “Our findings are in line with two earlier observations, i.e. older people most often receive help from their spouse when their functional capacity declines [25] and that walking outside the home was more common for older women who live alone than those living with another person [17].” (Page 10, lines 245-247)
“As those living with others have less experience of negotiating their nearby environment, they are probably also less aware of the environmental mobility barriers, which results in less reporting of them [26].” (Page 10, lines 250-252)